

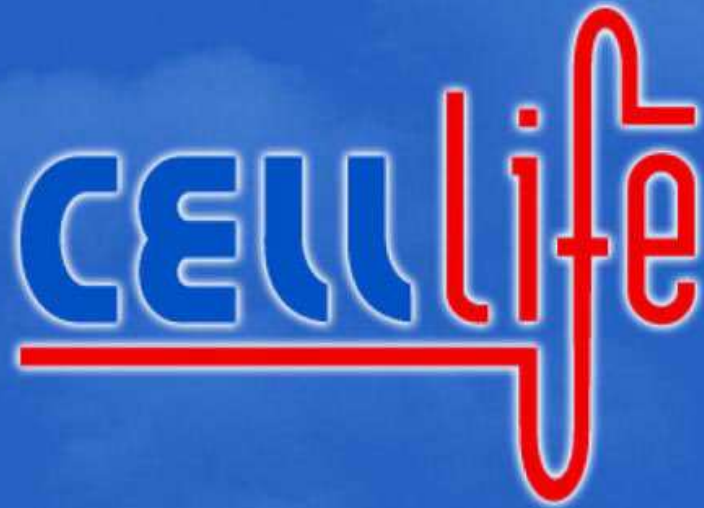
CELLlife™



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AN OVERVIEW: ICT-based Applications for Public Health Challenges

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Sep 2006

Cape Town, South Africa

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Presentation Overview



1. Who is Cell-Life?
2. Challenges Addressed
3. Cell-Life's Solutions:
 - Aftercare – HBC data collection
 - iDART – Pharmacy Management
 - Custom Solutions – AED, ARK
4. Key Lessons
5. The Future



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www.cell-life.org

CELLlife

1. Who is Cell-Life?



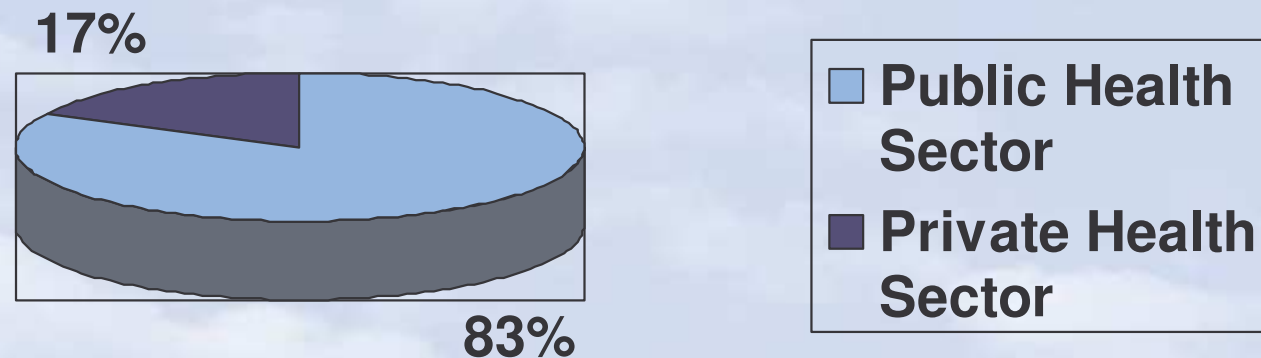
- Not-for-profit research-based organisation
- Started as a collaboration between UCT, CPUT & Corporate
- Based in Cape Town
- Innovative use of technology to provide effective and efficient support systems for public HIV/AIDS healthcare
- Aim to “Deliver the Best Solution”
- Health information management and monitoring through technological innovation

2. Challenges Addressed

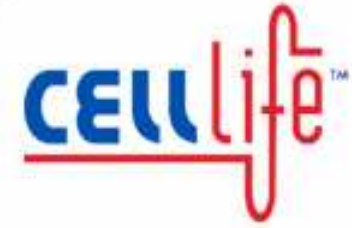


South Africa:

- Population Size ~46.9M (Stats SA)
- Gini Coefficient ~0.6 (one of the highest globally)
- HIV Infections ~3.7M (ASSA, Stats SA) or 7.7% of Population
- Medical Insurance Cover & Sectors:



2. Challenges Addressed



ART Requirements:

- Medical expertise and service delivery
- Reliable ARV supply
- Adherence compliance rate of 95%+
- Life-long treatment and support
- Monitor nutrition and diet regiment
- Clinical measures - laboratory blood tests

2. Challenges Addressed



Public Health Sector Limitations of ART:

- Infrastructure for service delivery
- Human capital constraints
- Disparity between urban, peri-urban and rural environments
- Lack of adherence support tools
- Limitation on financial resources
- Unequal access
- Cooperation of treating establishments
- Management process challenges

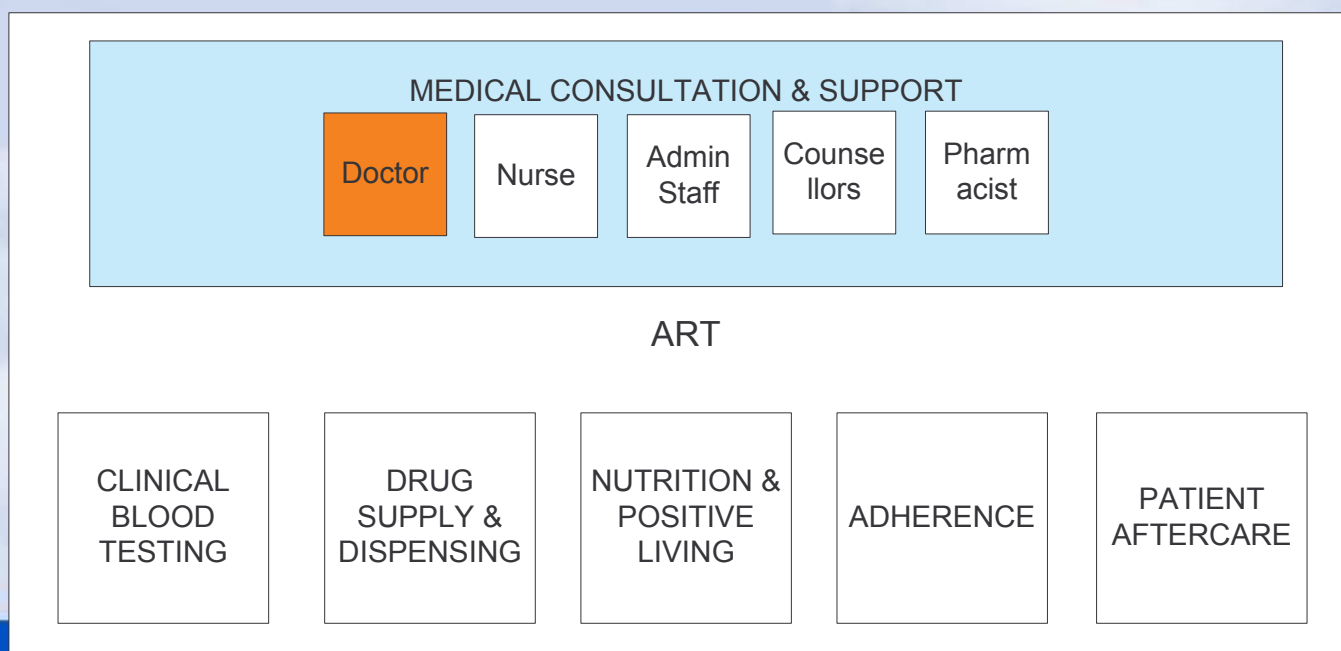
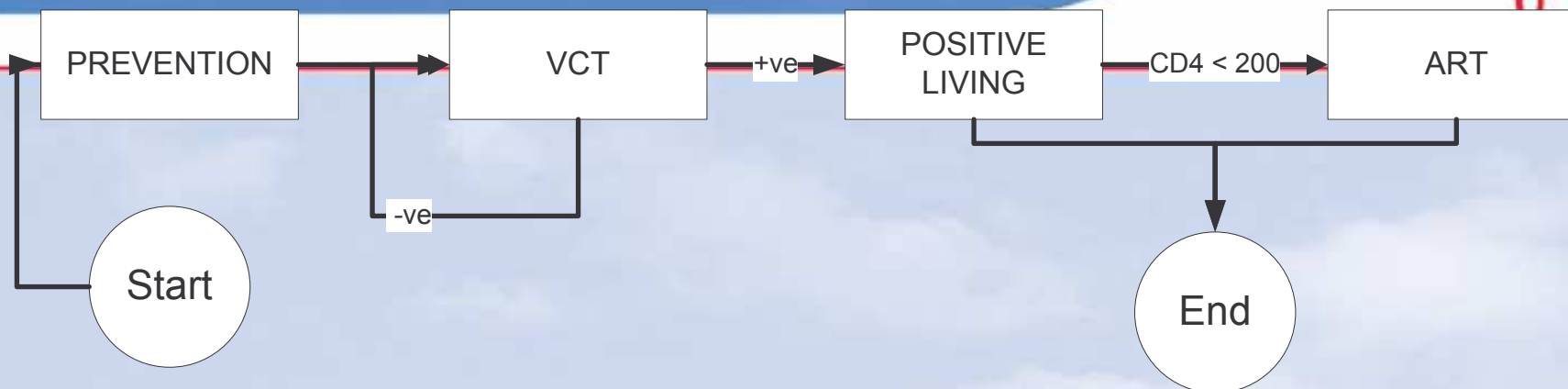
3. Cell-Life's Solution



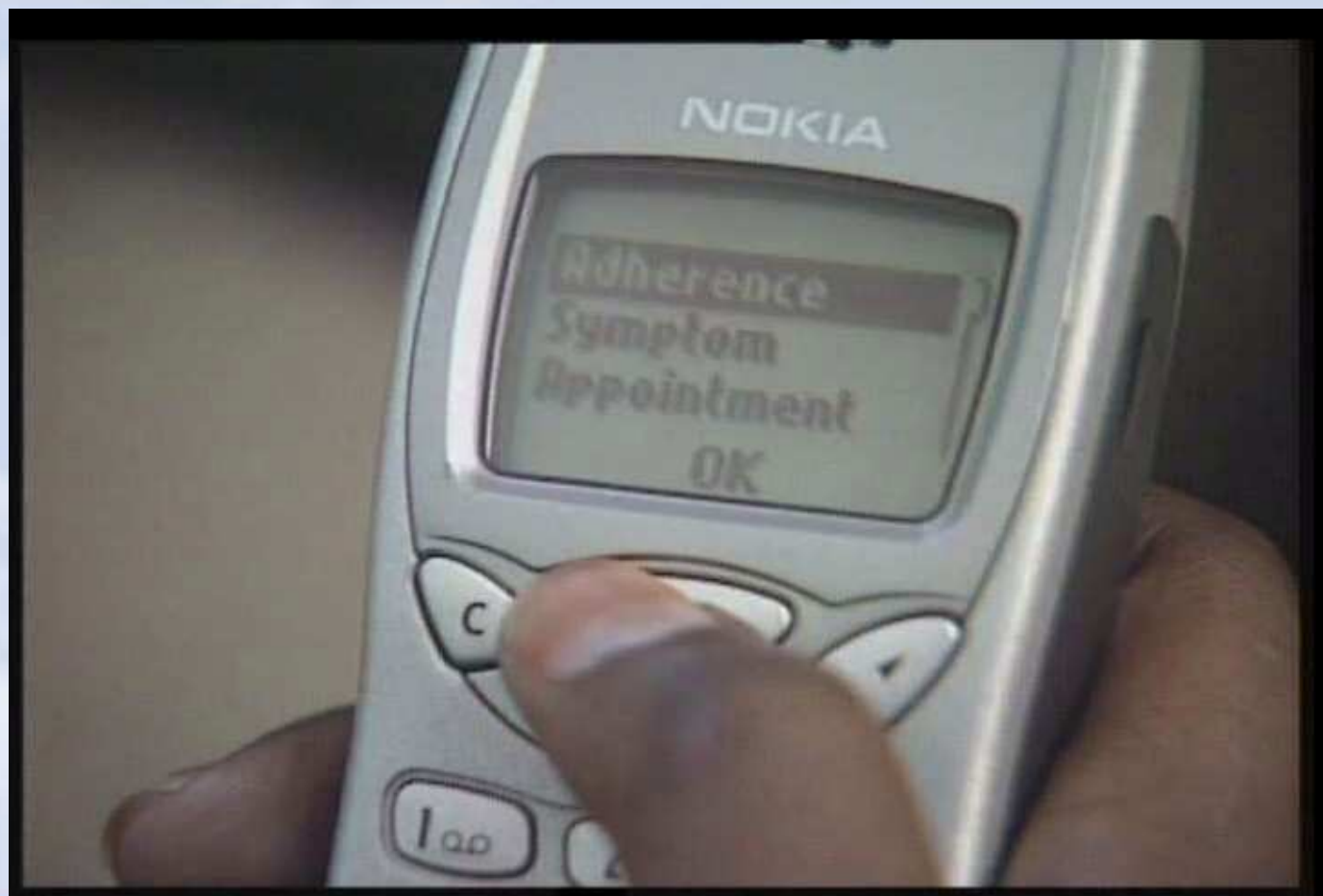
Cellular Technology

- Existing technology
- 41% usage within SA population (21 million users)
- 90% of SA population accessible by cellular networks
- Demographic distribution
- Affordable technology
- African comparison: 52 million users (32,5%)
- Global comparison: 1,35 billion users (1,25%)

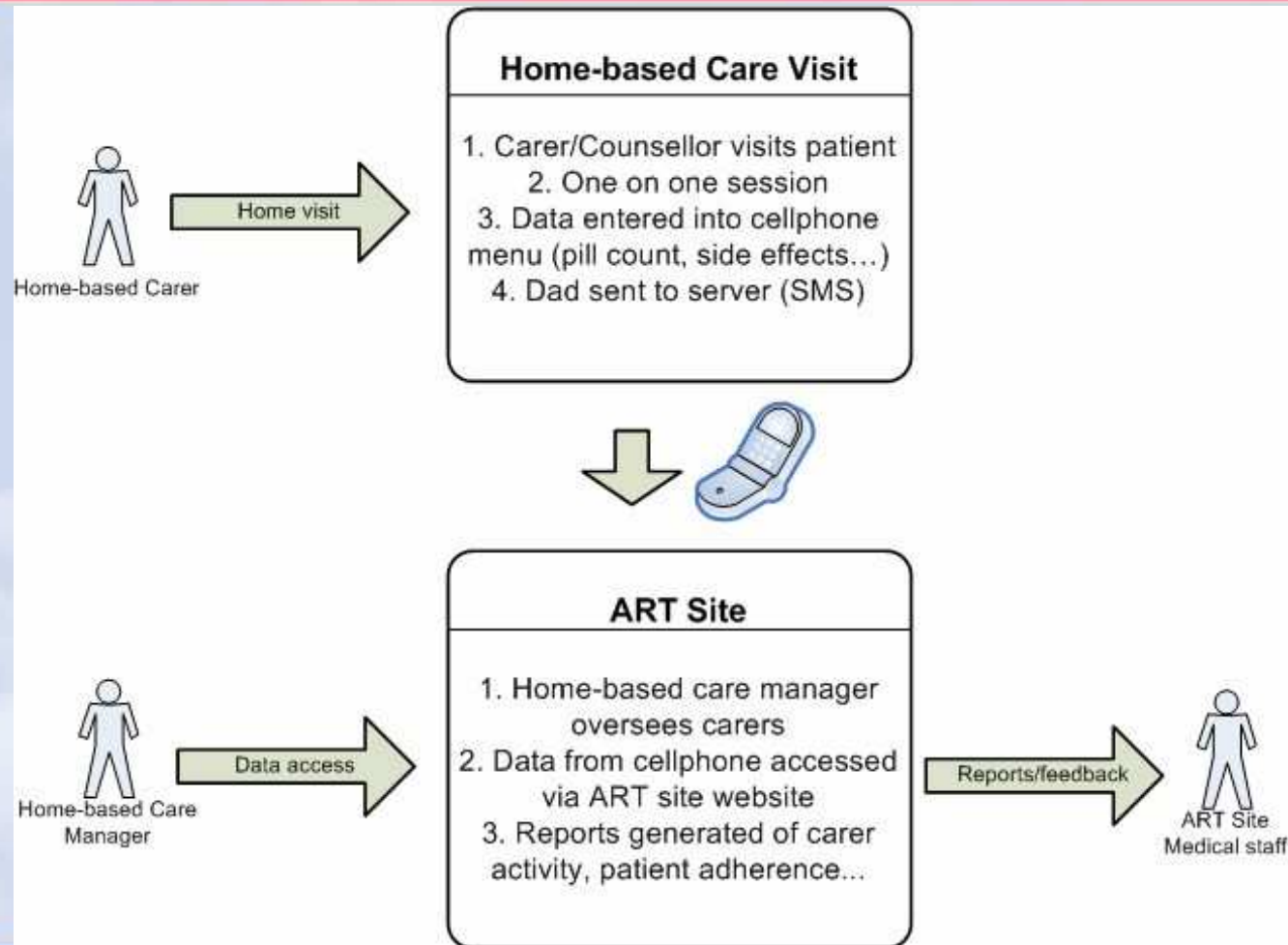
3. Cell-Life's Solution: *The Processes*







Aftercare: *The Process Flow*





```
graph TD; Menu[Menu] --> Drugs[Drugs]; Menu --> Symptoms[Symptoms]; Menu --> Alert[Alert];
```

Menu

Drugs

Symptoms

Alert

Examples of Data Collected



- Medication related information (pill counts, symptoms)
- Social status quo (living conditions, no of dependents)
- Mental/Emotional status quo (disclosure, alcohol)
- Financial situation (income, living conditions)
- Paediatrics M+E Data...



Cell phone



GSM Network



Cell-Life Database





T1 Adherence - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

https://www.cell-life.org.za:8443/NorthWest/T1AdherenceLog.do

statistics south africa

Hello Samir Anand
You are logged in as Cell-Life Admin

You last logged

[T1 Adherence Log](#)
[T2 General Log](#)
[Counsellors](#)
[Alerts](#)
[Send Messages](#)

T1 Adherence Log

Page 1 of 1 at 20 entries per page

Date	Report ID	Patient ID	Drug 1	Drug 1 Pill Count	Drug 1 Pills Missed	Drug 2	Drug 2 Pill Count	Drug 2 Pills Missed	Drug 3	Drug 3 Pill Count	Drug 3 Pills Missed	Difficult to Remember	Pickup Date	Symptom 1	Severity 1	Symptom 2	Severity 2	Symptom 3	Severity 3	TB Status	TB Treatment	Counse Firstnar
Wed 1 Jun 2005 09:15	301	123	None	0	0	None	0	0	None	0	0	N	0 / 0	None	None	None	None	None	None	Y	Y	Dirk
Fri 27 May 2005 12:58	300	123	None	0	0	None	0	0	None	0	0	N	0 / 0	None	None	None	None	None	None	Y	Y	Dirk
Tue 17 May 2005 19:28	299	123	None	0	0	None	0	0	None	0	0	N	0 / 0	None	None	None	None	None	None	Y	N	Dirk
Tue 17 May 2005 12:43	290	123	Efavirenz	1	2	AZT	2	2	3TC	3	3	Y	1 / 3	None	None	None	None	None	None	N	Y	Dirk
Tue 17 May 2005 12:42	282	123	Efavirenz	2	3	AZT	5	6	3TC	1	4	N	1 / 2	None	None	None	None	None	None	N	Y	Dirk
Tue 17 May 2005 12:34	275	123	Efavirenz	2	1	AZT	3	4	3TC	4	4	N	17 / 5	None	None	None	None	None	None	N	Y	Dirk
Mon 16 May 2005 16:31	262	123	Efavirenz	1	2	AZT	3	4	3TC	5	6	Y	16 / 5	Abdominal Pain	Low	vomiting	Medium	Rash	High	Y	Y	Jalal
Mon 16 May 2005 15:29	250	123	Efavirenz	2	2	AZT	6	6	3TC	8	8	Y	12 / 12	vomiting	Low	Rash	Low	Fever	High	Y	N	Jalal

Key:
Alert Set
TB not being Treated

Aftercare

Done

www.cell-life.org.za:8443



Hello piz nico

You are logged in as System Administrator

You last logged in: Wed 29 Mar 2006 15:30

[Would you like to Logout?](#)

[Adherence](#)

[Adherence Log](#)

[General Log](#)

[Alerts](#)

[Send Message](#)

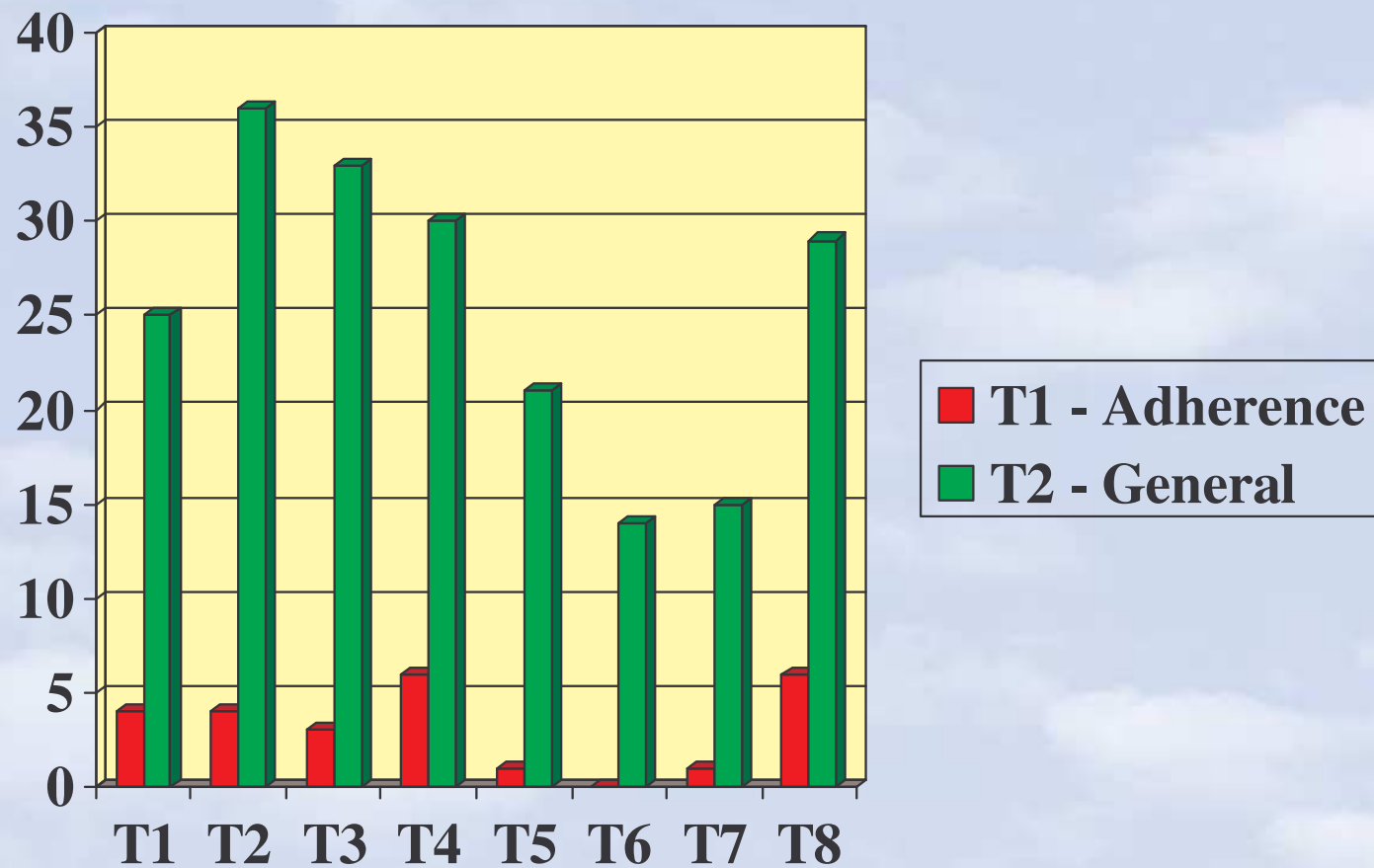
Counsellor Monthly Report September 2005

<<<

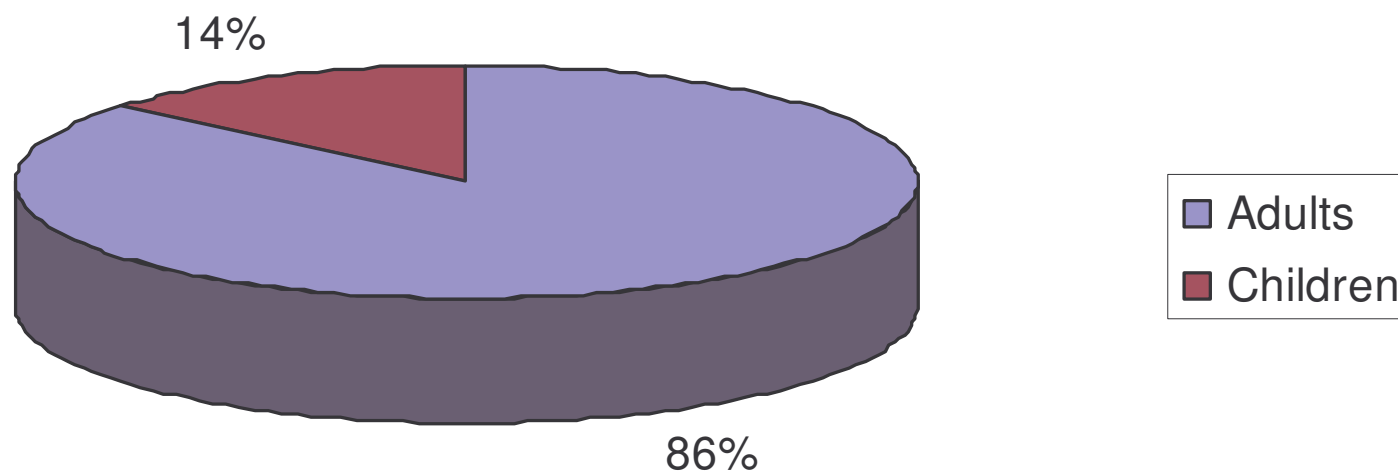
>>>

	Counsellor	Number of Reports Sent	Patients Visited
Counsellors	Angela Kegomoditswe	10	6
Overview	Boipelo Mandiwama	7	3
Add Counsellor	Dirk de Jager	0	0
Edit Counsellor	Elizabeth Gomotsanyang	15	8
Monthly Report	Emily Moses	4	4
Add Phone	Gedion Komitlhetse	6	6
Administration	Jalal Ghiassi-Razavi	0	0
My Settings	Joan (Doc) Lesetedi	0	0
Add User	Lorraine Gotiseome	4	4
Add Clinic	Onkarabetse Densen	0	0
	Rebecca Motlogelwa	0	0
	Samir Anand	1	1
	Ulrike Rivett	1	1
	sdfs sdfsd	0	0

HR Performance Management



Adults vs Children



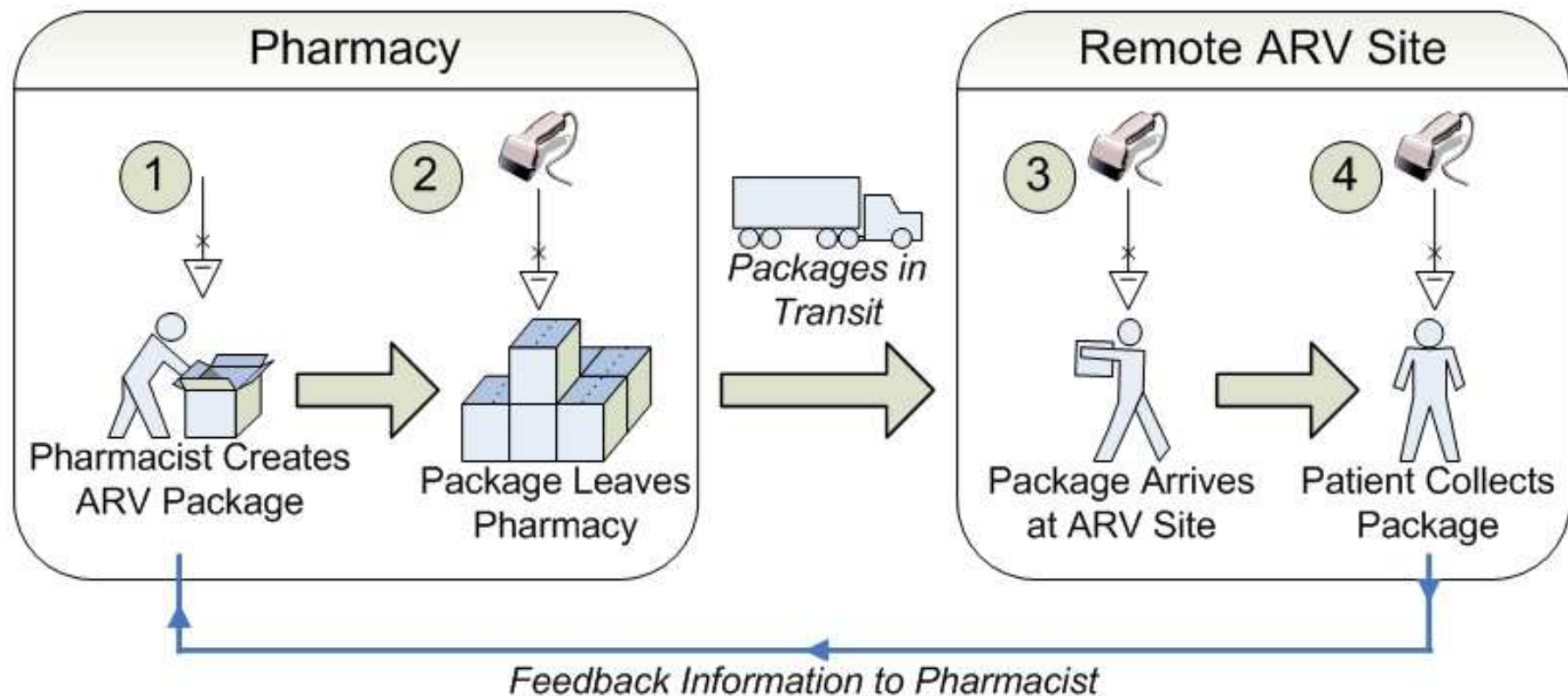
Data Manipulation



- System to monitor & control stock levels of ARV's for ART clinics
- Addresses bottlenecks such as: delivery times, theft, re-ordering, distribution, efficiency, tracking
- Another method of monitoring ART adherence
- Easily adaptable
- Supply of correct drugs and packaging for patients
- Specifically for ARV management and monitoring



iDART: *The Process Flow*





Reports



Stock Receipt Report (Stock Arrived at Pharmacy)



Outgoing Packages Report



Patient History Report



Stock Control Report (per clinic)



Monthly Report of Receipts and Issues of ARV Drugs



Graph of Active Patients in a Month

Back to the
Welcome Page



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Make up Patient ARV Packages

Select a Destination Clinic: CIPRA

Patients Needing Packages

YQ2-3511-1

ZZ2-3509-1

TS2-3523-1

ES2-3527-1

CL2-3506-1

BM2-3536-1

BN2-6520-2

DD1

Patient Information

Patient ID: YQ2-3511-1

Patient's Name: Yandisa Qomiyana

Patient's Age: 27

Distribution Clinic: CIPRA

Allergy Information

Allergy Type	Severity

Prescription Information

Prescription ID: 051031-YQ2-3511-1

Doctor: C. Orrel

Date of Last Pickup: 24 Jan 2006

Package Information

This is package number



2 of a 2



month prescription

Barcode	Drug Name	Dosage	Qty	Units in Stock
6006071002732	D4T / Stavudine 30mg Capsules ...	Take 1 capsule 1 times a day.	0	96
6001076145903	3TC / Lamivudine 150mg 60	Take 1 tablet 1 times a day.	0	797
6003422005145	Efavirens/Stocrin 600mg	Take 1 tablet 1 times a day.	0	6



Create Emergency Label

Redo an ARV Package

Print Labels

Close



Prescription History

Patient ID :	P145DA	Clinic :	Masiphumelele
Date of Birth :	1 January 2000	Sex :	Male

Prescription ID	060216-P145DA	Prescription Date	16/2/2006
Reason for Update	Intollerability	Prescription Duration	6 months
Doctor	Klemp, D		

Barcode	Drug Name	Quantity	Dosage
6001390107151	3TC / Lamivudine 150mg 60	1	1 tablet 2 times a day
6001390105553	D4T / Stavudine 40mg capsules 60	1	1 capsule 2 times a day
6001390107175	Aspen Nevirapine 200mg 60	1	1 tablet 2 times a day

Prescription ID	060130-P145DA	Prescription Date	30/1/2006
Reason for Update	Initial	Prescription Duration	6 months
Doctor	Potts, MA		

Barcode	Drug Name	Quantity	Dosage
6001390107151	3TC / Lamivudine 150mg 60	1	1 tablet 2 times a day
6001390105553	D4T / Stavudine 40mg capsules 60	1	1 capsule 2 times a day
6003422005145	Stocrin / Efavirenz	1	1 tablet 1 times a day



Month-End Report of Receipts & Issues of ARV

Facility Name: Desmond Tutu Centre Pharmacy: CIPRA
 Responsible Pharmacist: N. Killa B Pharm
 Balances for: March 2008
 Area (Pharmacy / Store): Pharmacy

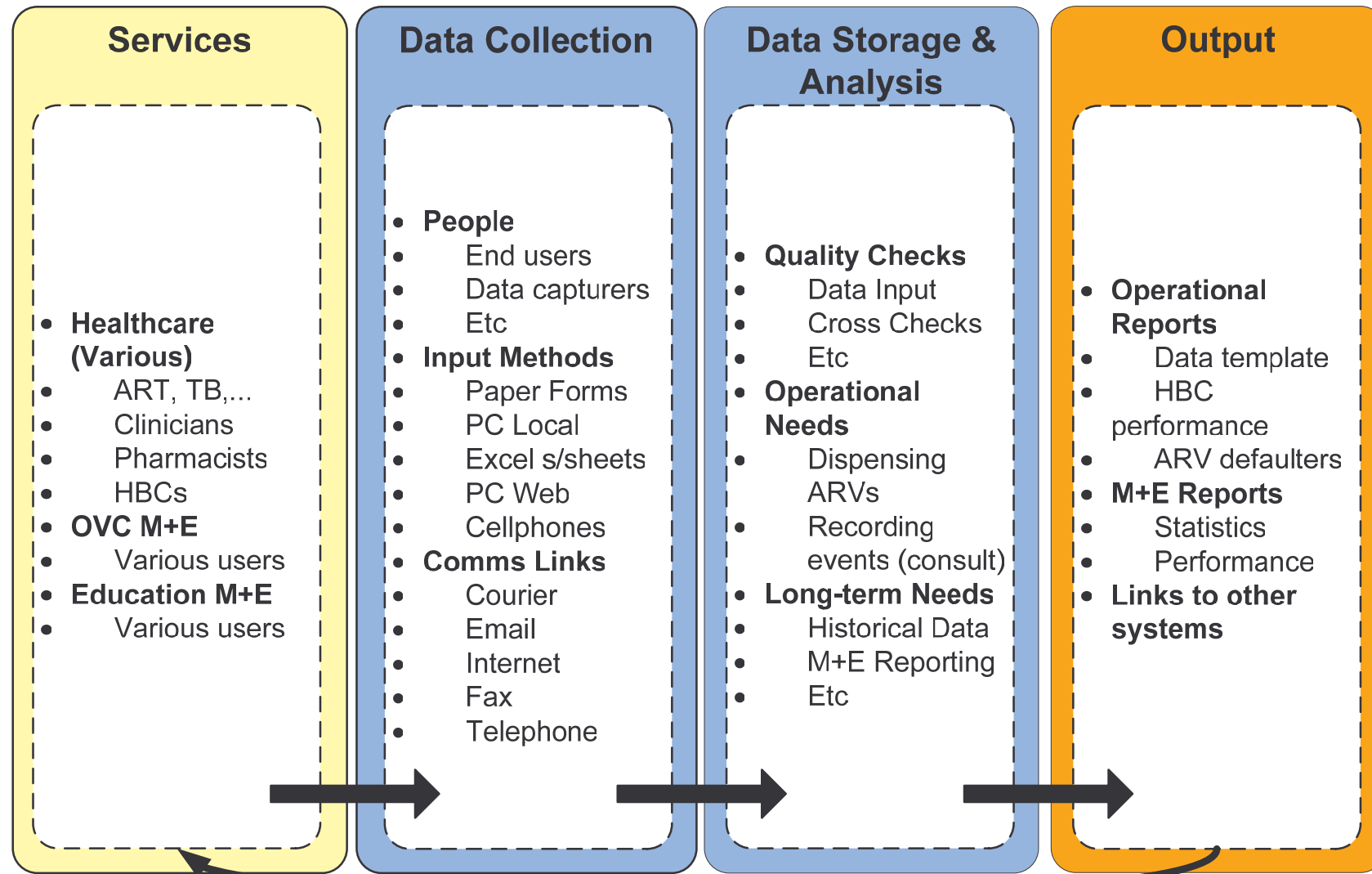
DRUG	OPENING BALANCE	STOCK RECEIVED	STOCK ISSUED	STOCK ON HAND	OUTSTANDING ORDERS
Tablets / Capsules	Number of Full Containers				
3TC / Lamivudine 150mg	0	0	0	0	
3TC / Lamivudine 150mg	200	122	187	135	
AZT / Zidovudine 300mg	2	0	1	1	
Aspen Nevirapine 200mg 60	62	1	15	48	
D4T / Stavudine 30mg	4	0	4	0	
D4T / Stavudine 30mg	132	0	65	67	
D4T / Stavudine 40mg	2	1	0	3	
D4T / Stavudine 40mg	166	2	121	47	
Kaletra Capsules 180	8	10	10	8	
NELFINAVIR 250mg	19	0	0	19	
Nevirapine 200mg Tablets	2	0	1	1	
Stocrin / Efavirenz 200mg	34	0	2	32	
Stocrin / Efavirenz 600mg	241	4	160	85	
Videx / Didanosine 100mg	2	0	2	0	
Videx 150mg Tablets 60	2	0	1	1	
Zidovudine 300mg Tablets	10	10	7	13	
ddl / Didanosine 100mg	4		7	8	



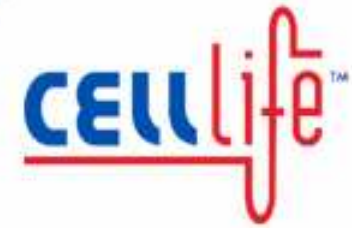
3. Cell-Life Solutions: *Custom*



GENERIC PROCESS OVERVIEW (Framework)



Case 1: The Problem?



How do you get 10,000 schools to report on the number of HIV/Aids peer education sessions that take place each month?

- Paper?
- Fax?
- Telephone?
- Email?

Remote Reporting System for AED (Monitoring Educational Events)

SCHOOLS:

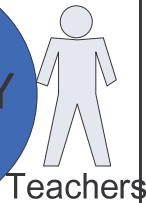
Many Schools
Location Independent
1000s children

School X



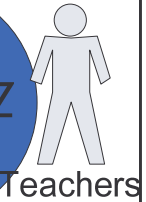
Teachers

School Y

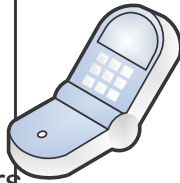


Teachers

School Z



Teachers

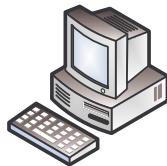


SMS (TOLLFREE)

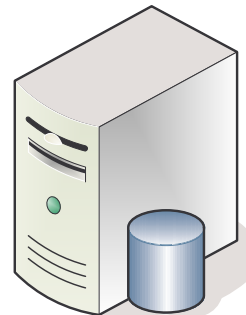
COURIER TO DC



WEB ACCESS

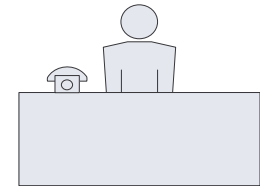


Central Database



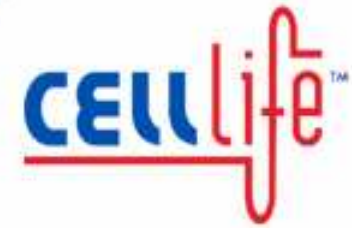
Secure Web Database
Complete Information System
Customised Needs

REPORTS



AED Administrator
(Location Independent)

Case 2: The Problem?

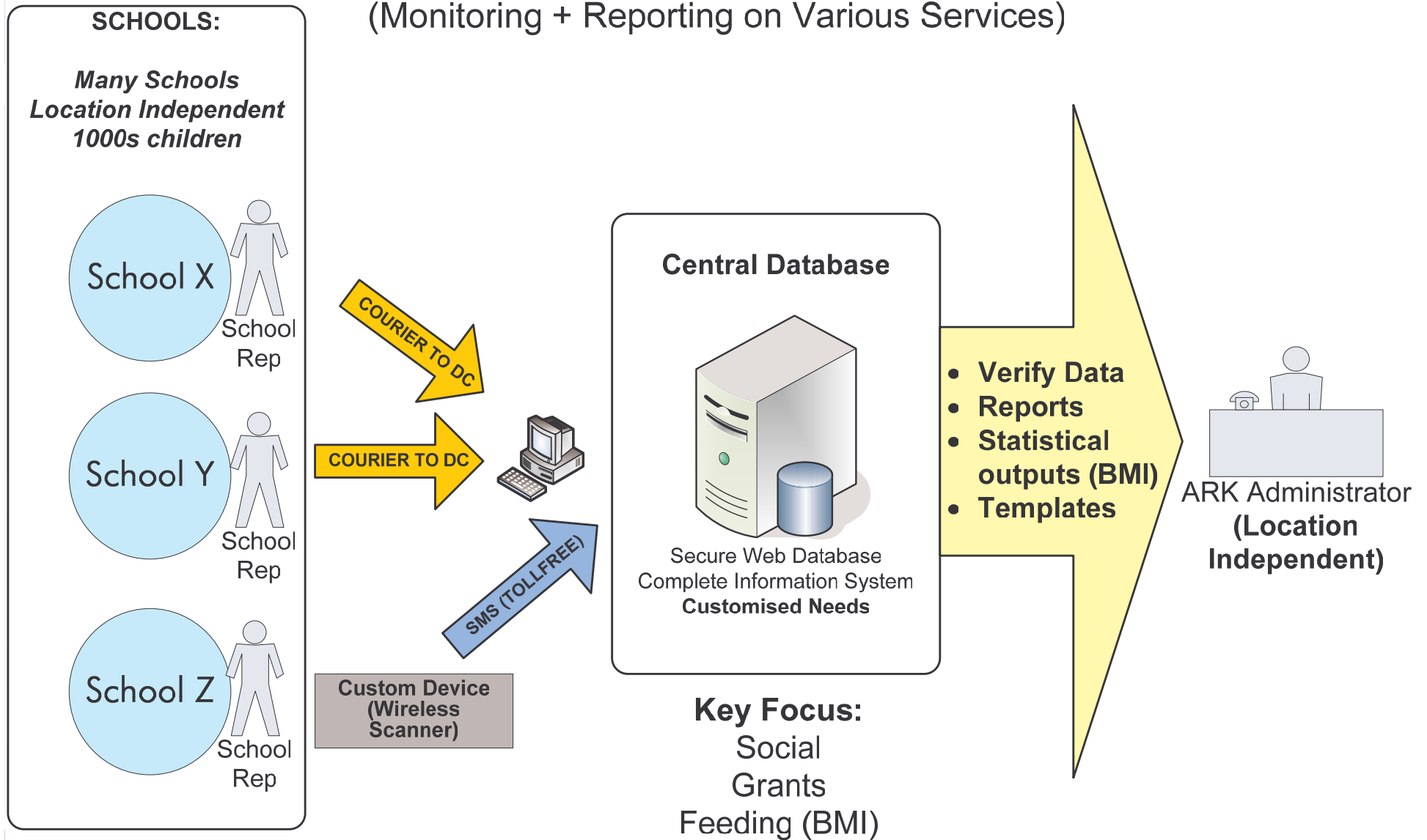


How do you develop a database for programme performance reporting on a child services project for the following areas: social, grants, feeding?

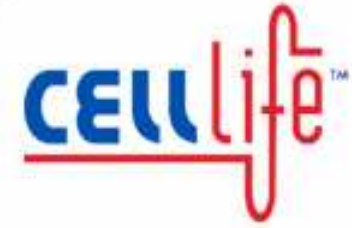
- There are existing processes/systems.
- Flexibility is required during the pilot phase.
- The system needs to be scalable.

Child Services M + E for ARK

(Monitoring + Reporting on Various Services)



3. Cell-Life's Solution: *Implementations*



Aftercare (Cellphone and Database Technology)

Sizophila Project Gugulethu (WC)

AED Version (MP, KZN, EC)

Taung & Koster Clinics (NW)

IDART (Pharmacy Management System)

Desmond Tutu HIV centre (WC)

Gugulethu Community Clinic (WC)

Masipumele Community Clinic (WC)

Taung Hospital (NW)

Hillbrow Clinic – RHRU (GT) (in process)

4. Key lessons learned:



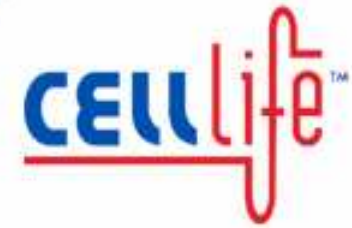
- Technology is not the solution to all problems
- Sustainability of systems is a major concern
- Key is understanding process – technology readiness
- Identifying champion – “buy-in”
- Monitor data quality (Paper systems Vs ICT)
- Flexibility of technology
- Technology must play a supportive role
- Difficulties in South Africa – different policies

4. Key lessons learned:



- Costs are important to keep low, start and in ops.
- Opensource (sharing - OpenMRS)
- IT Operations through Service Contracts
- Other benefits such as HR Performance tracking
- Easy of use – cellphone menus (HCI) vs pockets PCs
- Training and change management are critical areas
- Scalability from 3,000 to 300,000
- Adaptability of technology to wide range of applications

4. Key Lessons: *Urban vs. Rural*



URBAN:

1. Large patient numbers
2. Unmanageable data load
3. Communication
4. Crime
5. Politics

RURAL:

1. Communication
2. Transportation
3. Language barriers
4. Stigma
5. Infrastructure – e.g. Electricity
6. Network coverage
7. Accountability – volunteers
8. Distances to implementations

5. The Future



- Expand pilot sites implementations
- Support National Government ARV Roll-Out
- Grow and extend partnerships
- Extent the use of ICT in solutions
- Adapt the technology to other health areas or MTCT
- If Coca-Cola can reach Africa, then so can we!
- Attain financial sustainability

Acknowledgment





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